Host Status of *Dracaena* spp. to *Rotylenchulus reniformis*[1]

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INTRODUCTION: Dracaenas (Fig. 1) are ornamental plants commonly grown in Florida nurseries. They have the ability to withstand shading or suboptimal light conditions. Nurseries of South Florida produce several species of *Dracaena* which are destined for national and international markets. The Division of Plant Industry's Nematology Section's records of regulatory and survey samples from ornamentals indicate that the reniform nematode, *Rotylenchulus reniformis* Linford and Oliveira 1940, is often associated with many species of *Dracaena,* mostly from South Florida. However, information concerning the host status of dracaenas to *R. reniformis* is scant. Infestations by *R. reniformis,* a pest that damages vegetable and field crops in South and North Florida, have resulted in crop losses in South Florida averaging 10% on snap bean and squash (McSorley 1980) and ranging 9-40% on cotton in the southeastern United States (Robinson *et al.* 1997). The reniform nematode reproduces on many weeds and on more than 40 ornamentals (Inserra *et al.* 1994). The direct damage induced by the reniform nematode on ornamentals is usually not serious. However, *R. reniformis* is of great regulatory importance for ornamental growers exporting plants to certain states (Arizona, California, New Mexico) and countries (Argentina, Chile, South Africa, South Korea, Switzerland and Turkey) which impose restrictions against this pest. In host tests conducted in Texas, *R. reniformis* failed to infect and reproduce on *D. draco* (L.) L., dragon tree (Starr 1991). The objective of this circular is to provide information on the ability of *R. reniformis* to infect and reproduce on the most common *Dracaena* species grown as ornamentals in nurseries of South Florida.

Figure 1. Small container-grown dracaena plants. From left to right: *Dracaena cincta, D. deremensis,* and *D. cincta 'Tricolor'.* (Photography credit: Jeffrey Lotz):

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HOST TEST PROCEDURES: A 25-cm deep Rockdale loamy soil (40% sand, 31% silt, 28% clay, and pH = 7.3-7.8) was originally collected in Dade County from a snap bean field infested by *R. reniformis*. The soil was kept for four years in plastic pots and sown with successive crops of cowpea, *Vigna unguiculata* (L.) Walp., a good host of *R. reniformis* that favors nematode population increase. In 1997, soil from the pots was bulked, mixed and analyzed for *R. reniformis* densities. There were 2,000 nematodes per 100 cm^3 of soil. Eight-month-old rooted cuttings of *Dracaena cincta* Bak. (maroon-edged dracaena), *D. concinna* Kunth (purple-red-edged dracaena), *D. deremensis* Engl., *D. fragrans* (L.) Ker.-Gawl, and *D. sanderiana* hort. Sander ex Mast (Belgian evergreen) were planted in 15-cm diameter plastic pots containing the infested Rockdale soil. Cowpea cv. California 5 was grown in additional pots containing the infested soil to serve as a susceptible control. Pots with the *Dracaena* species and cowpea were distributed randomly on a greenhouse bench and maintained for six months at 20-32° C (68-90° F). The pots with cowpea were reseeded after 90 days because of the short cycle of this plant. In another experiment, also conducted in 1997, eight-month old rooted cuttings of *D. cincta* 'Tricolor' were planted in 15-cm diameter plastic pots infested with 1,000 *R. reniformis*/100 cm^3 of Rockdale soil. Plants were maintained on a greenhouse bench for four months. At the end of both experiments, dracaenas and cowpeas were removed from the pots and each root system was gently separated from the soil. A sample of about 2 grams of feeder roots was collected from each plant by removing root segments from several parts of the root system. Roots from each plant were gently washed with running tap water and examined with the aid of a stereomicroscope for swollen females and egg masses. Roots with decay symptoms were removed and analyzed for presence of fungal infection.

RESULTS: Nematode densities on roots are shown in Table 1. The number of replications used varied because the number of cuttings available for some *Dracaena* was very limited, therefore final nematode counts on roots were not averaged and results are listed for each replication.

Table 1. Number of *Rotylenchulus reniformis* females and eggs per gram of fresh roots of *Dracaena* species and cowpea (*Vigna unguiculata*) grown for six months in soil infested with 2,000 nematodes per 100 cm^3(Experiment 1), and for four months in soil infested with 1,000 nematodes per 100 cm^3 (Experiment 2).

EXPERIMENT 1										
Plant Species	**Replication I**		**Replication II**		**Replication III**		**Replication IV**		**Replication V**	
	♀	eggs	♀	eggs	♀	eggs	♀	eggs	♀	eggs
D. cincta	96	875	33	396	54	344	48	343	37	277
D. concinna	25	156	-	-	-	-	-	-	-	-
D. deremensis	33	290	49	523	42	257	-	-	-	-
D. fragrans	32	313	39	337	-	-	-	-	-	-
D. sanderiana	6	12	-	-	-	-	-	-	-	-
Vigna unguiculata	181	1,422	212	1,562	240	1,000	270	2,270	-	-
EXPERIMENT 2										
D. cincta 'Tricolor'	1	0	17	113	4	12	18	76	-	-

The nematode root densities shown in Table 1 indicate that *R. reniformis* infected and reproduced in the roots of all the dracaena species tested, but to a lesser extent than the control cowpea. Low nematode root densities were observed on *D. sanderiana* and *D. cincta* 'Tricolor' (Table 1). These two dracaena species also showed root fungal infection caused

by the fungi *Fusarium oxysporum* Schlechtend.: Fr. and *F. solani* (Mart.) Sacc. It is likely that the root decay caused by these fungi may have prevented greater nematode reproduction. Also we observed that *R. reniformis* populations increased dramatically (95 swollen females and 910 eggs/gram of fresh roots) on *D. cincta* 'Tricolor' plants which escaped fungal infection and were left in the greenhouse for six more months after the experiment concluded (data not reported in Table 1). As in the case of other ornamentals infected by the reniform nematode, no specific visual above ground symptoms were observed on nematode-infected dracaenas.

REGULATORY CONSIDERATIONS AND PREVENTIVE MEASURES: In South Florida, where *R. reniformis* is widespread under field conditions, dracaena growers should be particularly concerned about contamination risks to dracaenas through exposure to infected weeds, other infected ornamentals, and soil and root debris which may contain *R. reniformis* (Inserra *et al.* 1989, 1994; Robinson *et al.* 1997). Reniform nematode root infections, even at small population levels, should be of particular concern to dracaena growers because shipments of reniform nematode-infected dracaenas are rejected by the states and countries mentioned above and can result in serious financial losses for the growers. In nematode-certified nurseries with records of *R. reniformis* infestations, dracaenas should be grown using clean stocks, clean soil, and clean containers placed on benches not in contact with the ground. The lack of effective nematicides registered for use in ornamental nurseries make nematode control for regulatory purposes difficult in dracaena nurseries infested by this pest.

LITERATURE CITED

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